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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,901	09/20/2005	Hiroyuki Akagawa	Q90414	7222

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EXAMINER	
FRASER, STEWART A	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/01/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,901	AKAGAWA, HIROYUKI	
	Examiner	Art Unit	
	STEWART A. FRASER	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/20/2005 and 8/26/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is the initial office action for US Patent Application No. 10/549901 titled, "Substrate for Reticle and Method of Manufacturing the Substrate, and Mask Blank and Method of Manufacturing the Mask Blank".

2. Claims 1-16 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over MORIYA et al. (US 2003/0031890) in view of NOZAWA et al. (US 2002/0061452).

The MORIYA reference recites the preparation of an angular substrate. With respect to claims 1 and 9, MORIYA teaches (Claim 1) an angular substrate having a pair of opposed major surfaces and peripheral end faces there between, wherein as viewed in a peripheral cross-section,

a tapered edge portion is disposed between the peripheral end face and each major surface to define an inner boundary with the major surface, and has a width within 1 mm from the peripheral end face, and both or either one of said major surfaces of the substrate has a flatness of up to 0.5 μm in an outside region of the substrate that extends from a position spaced 3 mm inward from the peripheral end face to the inner boundary of the tapered edge portion. With respect to claims 5-7 and 13-15, MORIYA teaches [0042-0043] polishing the main surface of a substrate using a single-side polishing machine having a substrate support, a suede-type polishing pad and an abrasive fluid comprised of colloidal silica. MORIYA discloses that polishing under these conditions yielded a substrate having a flatness of not more than 0.3 μm in the inside region C extending inward from the position spaced 3 mm from the peripheral end face and a flatness of not more than 0.5 μm in the outside region B (Figure 4). The flatness of the substrate was further measured using a ZYGO Mark IV flatness tester capable of measurement over the entire surface. The MORIYA reference does not appear to explicitly teach the limitations of claims 1 and 9 directed to a maximum height between -1 and 0 μm from a reference substrate or the limitations of claims 2-4, 8, 10-12 and 16 directed to the formation of a thin film on the main surface of a reticle substrate.

However, the NOZAWA reference recites the preparation of a half-tone phase shift mask blank. With respect to claims 1-4, 8-12 and 16, NOZAWA teaches [0046] forming a phase shift mask blank such that the change in flatness of the substrate caused by formation of a translucent film is 1 μm or smaller, which corresponds to a film stress of 2×10^9 Pa or less. With the film thickness, transmittance and phase angle of the translucent film being adjusted to fit for an ArF excimer laser, the flatness change can be reduced to about 0.7 μm or smaller, whereby a

sufficient depth of focus can be secured. NOZAWA defines the term “flatness change" to mean a difference in flatness of a transparent substrate before film formation and after film formation, and the term "flatness" to represent a difference in height from a reference plane between the highest point and the lowest point of a substrate in a flatness quality area. NOZAWA further teaches [0044] subjecting the substrate having formed thereon a translucent film to a heat treatment to reduce the internal stress to a range acceptable for use as a phase shift mask blank. NOZAWA discloses that a higher heat treating temperature is more effective in reducing the internal stress, preferably a heating temperature of 200 degrees ^{o}C or higher.

At the time of the invention, one of ordinary skill in the art would have been motivated to modify the teachings of MORIYA to include the teachings of NOZAWA in order to prepare a reticle with a higher degree of flatness. MORIYA emphasizes [0007] the importance of forming a reticle substrate with a high degree of flatness because substrates that are formed with a low degree of flatness would not remain horizontal on the sample holder of an inspection instrument, thereby lowering the inspection sensitivity of the instrument. NOZAWA indicates [0072] that it is advantageous to use a transparent substrate having a convex surface on the translucent film side thereof in order to reduce the amount of internal stress that can be imparted to a substrate. By combining the teachings of the aforementioned references, one of ordinary skill in the art would have been able to achieve a higher degree of flatness to prevent deformations that may be caused by substrate holding members. Therefore, the claims specified in the instant application would have been obvious at the time the invention was made.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- TAKEUCHI et al. (US 2002/0155361) teaches a method of preparing a glass substrate.

- MORIYA et al. (US 2003/0036340) teaches a method for polishing angular substrates.

- KOIKE et al. (US 2003/0186624) teaches a method of determining the flatness of a substrate as well as a method of producing a mask blank.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEWART A. FRASER whose telephone number is (571)270-5126. The examiner can normally be reached on Monday to Thursday 6:30 am to 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/S. A. F./
Examiner, Art Unit 1795